UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/604,683	08/10/2003	Chih-Sheng Chou	LUCP0007USA	1682

27765   7590   03/29/2007
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EXAMINER
HUNG, STEPHEN C

ART UNIT	PAPER NUMBER
2615	

SHORTENED STATUTORY PERIOD OF RESPONSE	NOTIFICATION DATE	DELIVERY MODE
3 MONTHS	03/29/2007	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

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PTOL-90A (Rev. 10/06)

	Application No.	Applicant(s)
Office Action Summary	10/604,683	CHOU ET AL.
	Examiner	Art Unit	
	Stephen C. Hung	2615	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1) ☒ Responsive to communication(s) filed on *10 August 2003*.

2a) ☐ This action is **FINAL**.   2b) ☒ This action is non-final.

3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4) ☒ Claim(s) *1-29* is/are pending in the application.

   4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5) ☐ Claim(s) _____ is/are allowed.

6) ☒ Claim(s) *1-29* is/are rejected.

7) ☐ Claim(s) _____ is/are objected to.

8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9) ☐ The specification is objected to by the Examiner.

10) ☒ The drawing(s) filed on *10 August 2003* is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.

   Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

   Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   a) ☒ All   b) ☐ Some * c) ☐ None of:

   1. ☒ Certified copies of the priority documents have been received.

   2. ☐ Certified copies of the priority documents have been received in Application No. _____.

   3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

   * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
   Paper No(s)/Mail Date *See Continuation Sheet*.

4) ☐ Interview Summary (PTO-413)
   Paper No(s)/Mail Date. _____.

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

1.   This office action is in response to application filed on 08/10/2003. Claims 1-29

are pending and have been examined.

Information Disclosure Statement

2.   The information disclosure statements (IDS) submitted on 01/04/2006,

10/14/2005, and 08/23/2005 were considered by the examiner.

Claim Rejections - 35 USC § 102

3.   The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that

form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in a patent granted on an application for patent by another filed in the
> United States before the invention thereof by the applicant for patent, or on an international application
> by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this
> title before the invention thereof by the applicant for patent.

The changes made to 35 U.S.C. 102(e) by the American Inventors Protection Act

of 1999 (AIPA) and the Intellectual Property and High Technology Technical

Amendments Act of 2002 do not apply when the reference is a U.S. patent resulting

directly or indirectly from an international application filed before November 29, 2000.

Therefore, the prior art date of the reference is determined under 35 U.S.C. 102(e) prior

to the amendment by the AIPA (pre-AIPA 35 U.S.C. 102(e)).

4.   Claims **1-4, 6-8, 10-12, 14-16, 18, and 20-28** rejected under 35 U.S.C. 102(e) as

being anticipated by **Lee et al. (US 6,671,325 B2)**.

Consider **claim 1**, Lee teaches an apparatus (Figure 4) for transmitting and receiving

multiplexed audio and data information, the apparatus being adapted to a wireless

audio system (Figure 3) for receiving a plurality of input signals of various types, the

plurality of input signals at least comprising an analog audio signal (Figure 4, analog

source 305), a first digital audio signal (Figure 4, digital source 310), and a control

signal (Figure 4, clock 440), the apparatus comprising:

An analog-to-digital converter (Figure 4, A/D converter 315 and 320) for transforming

the analog audio signal (Figure 4, analog source 305) into a second digital audio signal

(Figure 4, lines between XMIT Buffer CNTLR 410 and A/D converters 315 and 320);

a signal-selecting device (Figure 4, XMIT Buffer CNTLR 410) electrically connected to

the analog-to-digital converter (Figure 4, A/D converter 315 and 320) for selecting either

the first digital audio signal or the second digital audio signal for outputting ("The

digitized samples of the analog signal are then transferred from the analog-to-digital

converters 315 and 320 or the variable sampling rate converter through the transmit

data buffer controller 410 to the transmit data buffer 415," column 13, lines 13-17);

a digital-signal-format transformer (Figure 4, R/S ECC Encode 420) electrically

connected to the signal-selecting device (Figure 4, XMIT Buffer CNTLR 410) for

transforming the first digital audio signal (Figure 4, digital source 310) or the second

digital audio signal (Figure 4, lines between XMIT Buffer CNTLR 410 and A/D

converters 315 and 320) into a pulse audio signal ("transmit frame," column 6, line 4);

and

a synthesizing module (Figure 4, frame format 425) electrically connected to the digital-

signal-format transformer (Figure 4, R/S ECC Encode 420) for merging the control

signal (Figure 4, clock 440) and the pulse audio signal ("transmit frame," column 6, line

4) into a digital signal of bit-stream form ("interleaved group of digitized samples of the

analog signal," column 14, lines 8-9).

Consider **claim 2**, Lee teaches the apparatus of claim 1, wherein the pulse audio

signal conforms to a pulse-code modulation (PCM) specification ("modulation is a pulse

position modulation," column 9, lines 63-64).

Consider **claim 3**, Lee teaches the apparatus of claim 1, wherein the signal-selecting

Device (Figure 4, XMIT Buffer CNTLR 410) is a multiplexer for selecting either the first

digital audio signal or the second digital audio signal for outputting ("The digitized

samples of the analog signal are then transferred from the analog-to-digital converters

315 and 320 or the variable sampling rate converter through the transmit data buffer

controller 410 to the transmit data buffer 415. The transmit data buffer controller 410

controls the access to and the retrieving from the transmit data buffer 415 of the

digitized samples of the analog signals" column 13, lines 13-20).

Consider **claim 4**, Lee teaches the apparatus of claim 1, wherein the wireless audio

system further comprises a modulation module (Figure 4, PPM Modulate 430)

electrically connected to the synthesizing module (Figure 4, frame format 425) for

modulating the digital signal of bit-stream form ("interleaved group of digitized samples

of the analog signal," column 14, lines 8-9) to generate a corresponding baseband

signal.

Consider **claim 6**, Lee teaches the apparatus of claim 4, wherein the wireless audio

System further comprises a transmitting circuit (Figure 4, BURST XMIT 435) electrically

connected to the modulation module (Figure 4, PPM Modulate 430) for transforming the

baseband signal into a RF signal and for transmitting the RF signal to a free space ("RF

signals into the wired or wireless communication medium 345," column 14, lines 58-59).

Consider **claim 7**, Lee teaches the apparatus of claim 6, wherein the wireless audio

system further comprises a receiver (Figure 5) comprising:

a receiving circuit (Figure 5, receiver 505) for receiving the RF signal and for generating

a corresponding baseband signal ("pulse position modulated digitized samples," column

15, line 22);

a demodulation module (Figure 5, demodulate 510) electrically connected to the

receiving circuit (Figure 5, receiver 505) for demodulating the baseband signal ("pulse

position modulated digitized samples," column 15, line 22) into a digital signal of bit-

stream form ("raw non-return to zero encoded data of the digitized samples," column 15,

line 22-23);

a separating module (Figure 5, Receive Buffer CNTLR 515) electrically connected to the

demodulation module (Figure 5, demodulate 510) for separating the digital signal of bit-

stream form ("raw non-return to zero encoded data of the digitized samples," column 15,

line 22-23) into a control signal (Figure 5, clock 560) and a pulse audio signal ("frame of

the digitized samples of the analog signal," column 16, lines 40-41);

a digital-signal-format transformer (Figure 5, R/S ECC 525) electrically connected to the

separating module (Figure 5, Receive Buffer CNTLR 515) for transforming the pulse

audio signal ("frame of the digitized samples of the analog signal," column 16, lines 40-

41) into a digital audio signal ("digitized samples," column 15, line 57);

a signal-judging device (Figure 5, Data Out Interface 550) electrically connected to the

digital-signal-format transformer (Figure 5, R/S ECC 525) for classifying the digital audio

signal into either a first digital audio signal (Figure 5, digital out 390) or a

second digital audio signal ("digitized samples of the audio signals," column 16, lines

46-48); and

a digital-to-analog converter (Figure 5, D/A convert 370 and 375) electrically connected

to the signal-judging device (Figure 5, Data Out Interface 550) for transforming the

second digital audio signal ("digitized samples of the audio signals," column 16, lines

46-48) into an analog audio signal (Figure 5, analog out 380 and 385).

Consider **claim 8**, Lee teaches the apparatus of claim 7, wherein signal-judging device

(Figure 5, Data Out Interface 550) is a de-multiplexer for classifying the digital audio

signal into either the first digital audio signal or the second digital audio signal ("The

data out interface 550 transfers the digitized samples of the analog signals to the digital-

to-analog converters 370 and 375 . . . . The data out interface also provides the frame of

digitized samples in a digital format 390 for further processing by external circuitry,"

column 16, lines 46-52).

Consider **claim 10**, Lee teaches an apparatus for transmitting and receiving multiplexed

audio and data information in a wireless audio system for receiving a digital signal of bit-

stream form, the apparatus (Figure 5) comprising:

a separating module (Figure 5, Receive Buffer CNTLR 515) for separating the digital

signal of bit-stream form ("raw non-return to zero encoded data of the digitized

samples," column 15, line 22-23) into a control signal (Figure 5, clock 560) and a pulse

audio signal ("frame of the digitized samples of the analog signal," column 16, lines 40-

41);

a digital-signal-format transformer (Figure 5, R/S ECC 525) electrically connected to the

separating module (Figure 5, Receive Buffer CNTLR 515) for transforming the pulse

audio signal ("frame of the digitized samples of the analog signal," column 16, lines 40-

41) into a digital audio signal ("digitized samples," column 15, line 57);

a signal-judging device (Figure 5, Data Out Interface 550) electrically connected to the

digital-signal-format transformer (Figure 5, R/S ECC 525) for classifying the digital audio

signal into either a first digital audio signal (Figure 5, digital out 390) or a

second digital audio signal ("digitized samples of the audio signals," column 16, lines

46-48); and

a digital-to-analog converter (Figure 5, D/A convert 370 and 375) electrically connected

to the signal-judging device (Figure 5, Data Out Interface 550) for transforming the

second digital audio signal ("digitized samples of the audio signals," column 16, lines

46-48) into an analog audio signal (Figure 5, analog out 380 and 385).

Consider **claim 11**, Lee teaches the apparatus of claim 10, wherein signal-judging

device (Figure 5, Data Out Interface 550) is a de-multiplexer for classifying the digital

audio signal into either the first digital audio signal or the second digital audio signal

("The data out interface 550 transfers the digitized samples of the analog signals to the

digital-to-analog converters 370 and 375 . . . The data out interface also provides the

frame of digitized samples in a digital format 390 for further processing by external

circuitry," column 16, lines 46-52).

Consider **claim 12,** Lee teaches the apparatus of claim 10, wherein the wireless audio

system further comprises a receiving circuit and a demodulation module, wherein the

receiving circuit (Figure 5, receiver 505) is used for receiving a RF signal to generate a

corresponding baseband signal ("pulse position modulated digitized samples," column

15, line 22), and the demodulation module (Figure 5, demodulate 510) is electrically

connected to the receiving circuit (Figure 5, receiver 505) for demodulating the

baseband signal ("pulse position modulated digitized samples," column 15, line 22) into

a digital signal of bit-stream form ("raw non-return to zero encoded data of the digitized

samples," column 15, line 22-23);

Consider **claim 14**, Lee teaches the apparatus of claim 10, wherein the pulse audio

signal conforms to a pulse-code modulation (PCM) specification ("modulation is a pulse

position modulation," column 9, lines 63-64).

Consider **claim 15**, Lee teaches the apparatus of claim 10, wherein the wireless audio

system further comprises a transmitter (Figure 4) for receiving a plurality of input signals

of various types, the plurality of input signals at least comprising an analog audio signal

(Figure 4, analog source 305), a first digital audio signal (Figure 4, digital source 310),

and a control signal (Figure 4, clock 440), the transmitter comprising:

an analog-to-digital converter (Figure 4, A/D converter 315 and 320) for transforming

the analog audio signal (Figure 4, analog source 305) into a second digital audio signal

(Figure 4, lines between XMIT Buffer CNTLR 410 and A/D converters 315 and 320);

a signal-selecting device (Figure 4, XMIT Buffer CNTLR 410) electrically connected to

the analog-to-digital converter (Figure 4, A/D converter 315 and 320) for selecting either

the first digital audio signal or the second digital audio signal for outputting ("The

digitized samples of the analog signal are then transferred from the analog-to-digital

converters 315 and 320 or the variable sampling rate converter through the transmit

data buffer controller 410 to the transmit data buffer 415," column 13, lines 13-17);

a digital-signal-format transformer (Figure 4, R/S ECC Encode 420) electrically

connected to the signal-selecting device (Figure 4, XMIT Buffer CNTLR 410) for

transforming the first digital audio signal (Figure 4, digital source 310) or the second

digital audio signal (Figure 4, lines between XMIT Buffer CNTLR 410 and A/D

converters 315 and 320) into a pulse audio signal ("transmit frame," column 6, line 4);

and

a synthesizing module (Figure 4, frame format 425) electrically connected to the digital-

signal-format transformer (Figure 4, R/S ECC Encode 420) for merging the control

signal (Figure 4, clock 440) and the pulse audio signal ("transmit frame," column 6, line

4) into a digital signal of bit-stream form ("interleaved group of digitized samples of the

analog signal," column 14, lines 8-9).

a modulation module (Figure 4, PPM Modulate 430) electrically connected to the

synthesizing module (Figure 4, frame format 425) for modulating the digital signal of bit-

stream form ("interleaved group of digitized samples of the analog signal," column 14,

lines 8-9) to generate a corresponding baseband signal.

a transmitting circuit (Figure 4, BURST XMIT 435) electrically connected to the

modulation module (Figure 4, PPM Modulate 430) for transforming the baseband signal

into a RF signal and for transmitting the RF signal to a free space ("RF signals into the

wired or wireless communication medium 345," column 14, lines 58-59).

Consider **claim 16**, Lee teaches the apparatus of claim 15, wherein the signal-selecting

device (Figure 4, XMIT Buffer CNTLR 410) is a multiplexer for selecting either the first

digital audio signal or the second digital audio signal for outputting ("The digitized

samples of the analog signal are then transferred from the analog-to-digital converters

315 and 320 or the variable sampling rate converter through the transmit data buffer

controller 410 to the transmit data buffer 415. The transmit data buffer controller 410

controls the access to and the retrieving from the transmit data buffer 415 of the

digitized samples of the analog signals" column 13, lines 13-20).

Consider **claim 18**, Lee teaches a wireless audio system (Figure 3) for transmitting and

receiving multiplexed audio and data information comprising:

a transmitter (Figure 4) for receiving a plurality of input signals of various types, the

plurality of input signals at least comprising a first digital audio input signal (Figure 4,

digital source 310), and a control input signal (Figure 4, clock 440), the transmitter

comprising:

a selecting-synthesizing device (Figure 4, XMIT Buffer CNTLR 410, R/S ECC ENCODE

420, frame format 425) for transforming the first digital audio input signal (Figure 4,

digital source 310) into a transformed digital audio signal ("digitized samples of the

audio signals," column 13, lines 19-20) and then for merging the transformed digital

audio signal with the control input signal (Figure 4, clock 440) to generate a digital input

signal of bit-stream form ("modulated carrier signal," column 14, line 48);

a modulation module (Figure 4, PPM Modulate 430) electrically connected to the

selecting-synthesizing device (Figure 4, XMIT Buffer CNTLR 410, R/S ECC ENCODE

420, frame format 425) for modulating the digital signal of bit-stream form ("interleaved

group of digitized samples of the analog signal," column 14, lines 8-9) to generate a

corresponding baseband signal.

a transmitting circuit (Figure 4, BURST XMIT 435) electrically connected to the

modulation module (Figure 4, PPM Modulate 430) for transforming the baseband signal

into a RF signal and for transmitting the RF signal to a free space ("RF signals into the

wired or wireless communication medium 345," column 14, lines 58-59).

a receiver (Figure 5, receiver 505) for receiving the RF signal to output a plurality of

output signals of various types, the receiver comprising: a receiving circuit (Figure 5,

receiver 505) for receiving the RF signal and for generating a corresponding baseband

signal ("pulse position modulated digitized samples," column 15, line 22);

a demodulation module (Figure 5, demodulate 510) electrically connected to the

receiving circuit (Figure 5, receiver 505) for demodulating the baseband signal ("pulse

position modulated digitized samples," column 15, line 22) into a digital signal of bit-

stream form ("raw non-return to zero encoded data of the digitized samples," column 15,

line 22-23);

a separating-classifying device (Figure 5, receive buffer CNTLR 515, R/S ECC 525, and Data Out Interface 550) for separating the digital signal of bit-stream form ("raw non-return to zero encoded data of the digitized samples," column 15, line 22-23) into a control signal (Figure 5, clock 560) and a pulse audio signal ("frame of the digitized samples of the analog signal," column 16, lines 40-41);

wherein the first digital audio output signal (Figure 5, digital out 390) and the control output signal (Figure 5, clock 560) respectively correspond to the first digital audio input signal (Figure 4, digital source 310) and the control input signal (Figure 4, clock 440).

Consider **claim 20**, Lee teaches the wireless audio system of claim 18, wherein the plurality of input audio signals further comprise an analog audio input signal (Figure 4, analog source 305).

Consider **claim 21**, Lee teaches the wireless audio system of claim 20, wherein the transmitter (Figure 4) further comprises an analog-to-digital converter (Figure 4, A/D Converter 315 and 320) for transforming the analog audio input signal (Figure 4, analog source 305) into a corresponding second digital audio input signal ("digitized samples of the analog signal," column 13, line 13), and the selecting-synthesizing device Figure 4, XMIT Buffer CNTLR 410, R/S ECC ENCODE 420, frame format 425) selects either the first digital audio input signal (Figure 4, digital source 310) or the second digital audio

input signal ("digitized samples of the analog signal," column 13, line 13) for a signal-format transforming process.

Consider **claim 22**, Lee teaches the wireless audio system of claim 21, wherein the separating-classifying device (Figure 5, receive buffer CNTLR 515, R/S ECC 525, and Data Out Interface 550) of the receiver (Figure 5) is used to determine that the digital audio output signal is either a first digital audio output signal (Figure 4, digital source 310) or a second digital audio output signal ("digitized samples of the analog signal," column 13, line 13).

Consider **claim 23**, Lee teaches the wireless audio system of claim 22, wherein the receiver (Figure 5) further comprises a digital-to-analog converter (Figure 5, D/A Convert 370, 375) electrically connected to the separating-classifying device (Figure 5, receive buffer CNTLR 515, R/S ECC 525, and Data Out Interface 550) for transforming the second digital audio output signal ("digitized samples of the analog signal," column 13, line 13) into a corresponding analog audio output signal (Figure 5, analog out 380 and 385).

Consider **claim 24**, Lee teaches the wireless audio system of claim 23, wherein the analog audio output signal (Figure 5, analog out 380 and 385) and the second digital audio output signal ("digitized samples of the analog signal," column 13, line 13) respectively correspond to the analog audio input signal (Figure 4, analog source 305)

and the second digital audio input signal ("digitized samples of the analog signal,"

column 13, line 13).

Consider **claim 25**, Lee teaches the wireless audio system of claim 24, wherein the

selecting-synthesizing device comprises:

a signal-selecting device (Figure 4, XMIT Buffer CNTLR 410) electrically connected to

the analog-to-digital converter (Figure 4, A/D converter 315 and 320) for selecting either

the first digital audio signal or the second digital audio signal for outputting ("The

digitized samples of the analog signal are then transferred from the analog-to-digital

converters 315 and 320 or the variable sampling rate converter through the transmit

data buffer controller 410 to the transmit data buffer 415," column 13, lines 13-17);

a digital-signal-format transformer (Figure 4, R/S ECC Encode 420) electrically

connected to the signal-selecting device (Figure 4, XMIT Buffer CNTLR 410) for

transforming the first digital audio signal (Figure 4, digital source 310) or the second

digital audio signal (Figure 4, lines between XMIT Buffer CNTLR 410 and A/D

converters 315 and 320) into a pulse audio signal ("transmit frame," column 6, line 4);

and

a synthesizing module (Figure 4, frame format 425) electrically connected to the digital-

signal-format transformer (Figure 4, R/S ECC Encode 420) for merging the control

signal (Figure 4, clock 440) and the pulse audio signal ("transmit frame," column 6, line 4) into a digital signal of bit-stream form ("interleaved group of digitized samples of the analog signal," column 14, lines 8-9).

Consider **claim 26**, Lee teaches the wireless audio system of claim 18, wherein the pulse audio signal conforms to a pulse-code modulation (PCM) specification ("modulation is a pulse position modulation," column 9, lines 63-64).

Consider **claim 27**, Lee teaches the wireless audio system of claim 24, wherein the separating-classifying device (Figure 5, receive buffer CNTLR 515, R/S ECC 525, and Data Out Interface 550) comprises:

a separating module (Figure 5, Receive Buffer CNTLR 515) for separating the digital signal of bit-stream form ("raw non-return to zero encoded data of the digitized samples," column 15, line 22-23) into a control signal (Figure 5, clock 560) and a pulse audio signal ("frame of the digitized samples of the analog signal," column 16, lines 40-41);

a digital-signal-format transformer (Figure 5, R/S ECC 525) electrically connected to the separating module (Figure 5, Receive Buffer CNTLR 515) for transforming the pulse audio signal ("frame of the digitized samples of the analog signal," column 16, lines 40-41) into a digital audio signal ("digitized samples," column 15, line 57);

(

a signal-judging device (Figure 5, Data Out Interface 550) electrically connected to the

digital-signal-format transformer (Figure 5, R/S ECC 525) for classifying the digital audio

signal into either a first digital audio signal (Figure 5, digital out 390) or a

second digital audio signal ("digitized samples of the audio signals," column 16, lines

46-48);

Consider **claim 28**, Lee teaches the wireless audio system of claim 18, wherein the

pulse audio signal conforms to a pulse-code modulation (PCM) specification

("modulation is a pulse position modulation," column 9, lines 63-64).

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all

obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set
> forth in section 102 of this title, if the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have been obvious at the time the
> invention was made to a person having ordinary skill in the art to which said subject matter pertains.
> Patentability shall not be negatived by the manner in which the invention was made.

6.   The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1.   Determining the scope and contents of the prior art.
2.   Ascertaining the differences between the prior art and the claims at issue.
3.   Resolving the level of ordinary skill in the pertinent art.
4.   Considering objective evidence present in the application indicating
        obviousness or nonobviousness.

7.   **Claims 5, 9, 13, 17, 19, and 29** are rejected under 35 U.S.C. 103(a) as being

unpatentable over **Lee et al. (US 6,671,325 B2)** in view of **KHAYRALLAH et al. (US**

2001/0044294 A1).

Consider **claim 5**, Lee teaches the apparatus (Figure 4) of claim 4 having a modulation

module (Figure 4, PPM Modulate 430).

However, Lee does not explicitly teach that the modulation module comprises a

modulation circuit electrically connected to the synthesizing module for modulating the

digital signal of bitstream form to generate a modulated signal; and a spreading circuit

electrically connected to the modulation circuit for proceeding operations between the

modulated signal and a spreading code to generate the baseband signal.

In the same field of endeavor, KHAYRALLAH et al. teaches a modulation module

(Figure 6A) comprising a modulation circuit (Figure 6A, pi/4 DQPSK Modulating 513) for

modulating the digital signal of bitstream form to generate a modulated signal ("the

encoded and interleaved bits are then modulated," paragraph [0049]); and a spreading

circuit (Figure 6A, WalshHadamard Coding 611) electrically connected to the

modulation circuit (Figure 6A, pi/4 DQPSK Modulating 513) for proceeding operations

between the modulated signal and a spreading code ("spreading code," paragraph

[0012]) to generate the baseband signal (Figure 6A, radio communications signal 515).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the

invention to incorporate the modulation circuit and spreading circuit of KHAYRALLAH et

al. into the modulation module of Lee.

This would be advantageous since "CDMA communications can be less vulnerable to

coherent noise sources which might jam other communications signals" and "The use of

the unique spreading code allows several channels to effectively share the same

bandwidth" (KHAYRALLAH et al., paragraph [0012]).

Consider **claim 9**, Lee teaches the apparatus (Figure 5) of claim 7 having a

demodulation module (Figure 5, demodulate 510).

However, Lee does not explicitly teach that the demodulation module comprises a de-

spreading circuit and a demodulation circuit, wherein the de-spreading circuit executes

a convolution/multiplication operation between the baseband signal and a spreading

code to transform the baseband signal into a de-spreading signal, and the

demodulation circuit then demodulates the de-spreading signal to generate the digital

signal of bit-stream form.

In the same field of endeavor, KHAYRALLAH et al. teaches a demodulation module

(Figure 6B) comprising a de-spreading circuit (Figure 6B, Walsh Hadmard Transform

652) and a demodulation circuit (Figure 6B, coherent demodulating 551), wherein the

de-spreading circuit (Figure 6B, Walsh Hadmard Transform 652) executes a

convolution/multiplication operation ("convolutional coding," paragraph [0047]) between

the baseband signal (Figure 6B, radio communications signal 515) and a spreading

code ("spreading code," paragraph [0012]) to transform the baseband signal (Figure 6B,

radio communications signal 515) into a de-spreading signal, and the demodulation

circuit (Figure 6B, coherent demodulating 551) then demodulates the de-spreading

signal to generate the digital signal of bit-stream form (Figure 6B, Data Link Layer frame

410').

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the

invention to incorporate the demodulation circuit and despreading circuit of

KHAYRALLAH et al. into the modulation module of Lee.

This would be advantageous since "CDMA communications can be less vulnerable to

coherent noise sources which might jam other communications signals" and "The use of

the unique spreading code allows several channels to effectively share the same

bandwidth" (KHAYRALLAH et al., paragraph [0012]).

Consider **claim 13**, Lee teaches the apparatus (Figure 5) of claim 12 having a

demodulation module (Figure 5, demodulate 510).

However, Lee does not explicitly teach that the demodulation module comprises a de-spreading circuit and a demodulation circuit, wherein the de-spreading circuit executes a convolution/multiplication operation between the baseband signal and a spreading code to transform the baseband signal into a de-spreading signal, and the demodulation circuit then demodulates the de-spreading signal to generate the digital signal of bit-stream form.

In the same field of endeavor, KHAYRALLAH et al. teaches a demodulation module (Figure 6B) comprising a de-spreading circuit (Figure 6B, Walsh Hadmard Transform 652) and a demodulation circuit (Figure 6B, coherent demodulating 551), wherein the de-spreading circuit (Figure 6B, Walsh Hadmard Transform 652) executes a convolution/multiplication operation ("convolutional coding," paragraph [0047]) between the baseband signal (Figure 6B, radio communications signal 515) and a spreading code ("spreading code," paragraph [0012]) to transform the baseband signal (Figure 6B, radio communications signal 515) into a de-spreading signal, and the demodulation circuit (Figure 6B, coherent demodulating 551) then demodulates the de-spreading signal to generate the digital signal of bit-stream form (Figure 6B, Data Link Layer frame 410').

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the demodulation circuit and despreading circuit of KHAYRALLAH et al. into the modulation module of Lee.

This would be advantageous since "CDMA communications can be less vulnerable to

coherent noise sources which might jam other communications signals" and "The use of

the unique spreading code allows several channels to effectively share the same

bandwidth" (KHAYRALLAH et al., paragraph [0012]).

Consider **claim 17**, Lee teaches the apparatus (Figure 4) of claim 15 having a

modulation module (Figure 4, PPM Modulate 430).

However, Lee does not explicitly teach that the modulation module comprises a

modulation circuit electrically connected to the synthesizing module for modulating the

digital signal of bitstream form to generate a modulated signal; and a spreading circuit

electrically connected to the modulation circuit for proceeding operations between the

modulated signal and a spreading code to generate the baseband signal.

In the same field of endeavor, KHAYRALLAH et al. teaches a modulation module

(Figure 6A) comprising a modulation circuit (Figure 6A, pi/4 DQPSK Modulating 513) for

modulating the digital signal of bitstream form to generate a modulated signal ("the

encoded and interleaved bits are then modulated," paragraph [0049]); and a spreading

circuit (Figure 6A, WalshHadamard Coding 611) electrically connected to the

modulation circuit (Figure 6A, pi/4 DQPSK Modulating 513) for proceeding operations

between the modulated signal and a spreading code ("spreading code," paragraph

[0012]) to generate the baseband signal (Figure 6A, radio communications signal 515).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the

invention to incorporate the modulation circuit and spreading circuit of KHAYRALLAH et

al. into the modulation module of Lee.

This would be advantageous since "CDMA communications can be less vulnerable to

coherent noise sources which might jam other communications signals" and "The use of

the unique spreading code allows several channels to effectively share the same

bandwidth" (KHAYRALLAH et al., paragraph [0012]).

Consider **claim 19**, Lee teaches the apparatus (Figure 4) of claim 18 having a

modulation module (Figure 4, PPM Modulate 430).

However, Lee does not explicitly teach that the modulation module comprises a

modulation circuit being a pi/4 DQPSK modulation circuit and electrically connected to

the synthesizing module for modulating the digital signal of bitstream form to generate a

modulated signal; and a spreading circuit electrically connected to the modulation circuit

for proceeding operations between the modulated signal and a spreading code to

generate the baseband signal.

In the same field of endeavor, KHAYRALLAH et al. teaches a modulation module (Figure 6A) comprising a pi/4 DQPSK modulation circuit (Figure 6A, pi/4 DQPSK Modulating 513) for modulating the digital signal of bitstream form to generate a modulated signal ("the encoded and interleaved bits are then modulated," paragraph [0049]); and a spreading circuit (Figure 6A, WalshHadamard Coding 611) electrically connected to the modulation circuit (Figure 6A, pi/4 DQPSK Modulating 513) for proceeding operations between the modulated signal and a spreading code ("spreading code," paragraph [0012]) to generate the baseband signal (Figure 6A, radio communications signal 515).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the modulation circuit and spreading circuit of KHAYRALLAH et al. into the modulation module of Lee.

This would be advantageous since "CDMA communications can be less vulnerable to coherent noise sources which might jam other communications signals" and "The use of the unique spreading code allows several channels to effectively share the same bandwidth" (KHAYRALLAH et al., paragraph [0012]).

Consider **claim 29**, Lee teaches the apparatus (Figure 5) of claim 18 having a demodulation module (Figure 5, demodulate 510).

However, Lee does not explicitly teach that the demodulation module comprises a de-spreading circuit and a pi/4 DQPSK demodulation circuit, wherein the de-spreading circuit executes a convolution/multiplication operation between the baseband signal and a spreading code to transform the baseband signal into a de-spreading signal, and the demodulation circuit then demodulates the de-spreading signal to generate the digital signal of bit-stream form.

In the same field of endeavor, KHAYRALLAH et al. teaches a demodulation module (Figure 6B) comprising a de-spreading circuit (Figure 6B, Walsh Hadmard Transform 652) and a pi/4 DQPSK demodulation circuit (Figure 6B, coherent demodulating 551 and "pi/4 DQPSK," paragraph [0049]), wherein the de-spreading circuit (Figure 6B, Walsh Hadmard Transform 652) executes a convolution/multiplication operation ("convolutional coding," paragraph [0047]) between the baseband signal (Figure 6B, radio communications signal 515) and a spreading code ("spreading code," paragraph [0012]) to transform the baseband signal (Figure 6B, radio communications signal 515) into a de-spreading signal, and the demodulation circuit (Figure 6B, coherent demodulating 551) then demodulates the de-spreading signal to generate the digital signal of bit-stream form (Figure 6B, Data Link Layer frame 410').

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate the demodulation circuit and despreading circuit of KHAYRALLAH et al. into the modulation module of Lee.

This would be advantageous since "CDMA communications can be less vulnerable to coherent noise sources which might jam other communications signals" and "The use of the unique spreading code allows several channels to effectively share the same bandwidth" (KHAYRALLAH et al., paragraph [0012]).

Conclusion

8.   The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Dent (5,909,460) teaches an efficient apparatus for simultaneous modulation and digital beamforming.

Rydbeck et al. (US 6,332,006 B1) teaches an apparatus and method for providing high-penetration messaging in wireless communications systems.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Stephen C. Hung whose telephone number is (571)270-1457. The examiner can normally be reached on M-Th 7:30am-5pm, Every other Friday 7:30am-4:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (571)272-7564. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date :1/04/2006, 10/14/2005, 8/23/2005.